

IN THE CLAIMS:

A complete listing of all the claims is now presented:

Claim 1. (Currently Amended).

A method for gasifying organic substances and substance mixtures, in connection with which the organic substances are split in a pyrolysis reactor through contact with a hot heat-carrying medium into a carbon-containing residue and pyrolysis gases; and the solid, carbon-containing residue is supplied to a firing stage and ~~burnt~~ burned there, whereby at least proportions of the liberated heat are used for heating up the heat-carrying medium; and the pyrolysis gases, after possibly adding a reactant such as steam in a second reaction zone, and with the use of at least a portion of the heat liberated in the firing stage, are after-heated through indirect heat exchange in such a way that a product with a high calorific value is obtained, characterized in that comprising the steps of

- (a) separating the heat-carrying medium, upon exiting from the pyrolysis reactor, ~~is separated~~ from the solid, carbon-containing residue in a separation stage and supplied supplying it to a heating-up zone;

- (b) burning the solid, carbon-containing residue ~~is burnt~~ in a firing stage;
- (c) passing the hot exhaust gases of the firing stage ~~are passed in~~ into the heating-up zone through a fill of the heat-carrying medium, whereby they transfer a large part of their sensible heat to the heat-carrying medium;
- (d) extracting the heated-up heat-carrying medium ~~is extracted~~ from the heating-up zone into the second reaction zone designed in the form of a migrating bed reactor, where the mixture comprised of pyrolysis gases and reactant is heated up and converted into the product gas; and
- (e) recycling the heat-carrying medium ~~is recycled~~ into the pyrolysis reactor after passing through the second reaction zone.

Claim 2. (Currently Amended).

The method according to claim 1, ~~characterized in that of~~ wherein the reaction of pyrolysis gases with the steam is carried out in the presence of a catalyst.

Claim 3. (Currently Amended).

The method according to claim 1, ~~characterized in that~~

wherein the heat-carrying medium consists of refractory substances ~~such as~~ comprising sand, gravel, split, alumino-silicate, corundum, graywacke, quartzite, or cordierite.

Claim 4. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the heat-carrying medium consists of shaped bodies of metallic materials, and among such materials ~~preferably of~~ are magnetic materials or non-metallic ceramic materials, and also sintered materials or iron ore pellets.

Claim 5. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the totality of the heat-carrying medium used consists at least partly of a material that is catalytically active in the second reaction zone.

Claim 6. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the separation of the heat-carrying medium from the solid, carbon-containing residue is carried out mechanically upon

exiting from the pyrolysis reactor via a single- or multi-stage screening stage.

Claim 7. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the separation of the heat-carrying medium from the solid, carbon-containing residue upon exiting from the pyrolysis reactor is carried out magnetically.

Claim 8. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the separation of the heat-carrying medium from the solid, carbon-containing residue is carried out upon exiting from the pyrolysis reactor pneumatically with the help of wind sifting, and that the sifting medium is preferably air, ~~or and in turn again preferably~~ combustion air for the firing stage, or exhaust gas, ~~in turn preferably again or~~ exhaust gas recycled from the firing stage.

Claim 9. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein a portion of the pyrolysis gases or of the product gas is burnt in the firing stage for the carbon-containing

residue, or in a separate firing stage, and the heat liberated in said stage is used in the pyrolysis and in the second reaction stage.

Claim 10. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein a portion of the solid, carbon-containing residue is recycled into the pyrolysis or the second reaction zone separately or together with the heat-carrying medium.

Claim 11. (Currently Amended):

The method according to claim 1, ~~characterized in that~~ wherein at least one of the following media is conveyed discontinuously or in batches when exiting from the ~~pryolysis~~ ~~pyrolysis~~ reactor: organic substance; heat-carrying medium; solid, carbon-containing residue; mixture of heat-carrying medium and solid, carbon-containing residue.

Claim 12. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the sensible heat of the product gas and the exhaust gas of the firing stage is at least partially used for generating

the steam as the reactant, or for preheating the air for the firing stage.

Claim 13. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the sensible heat of the product gas and the exhaust gas of the firing stage is at least partially used for heating up the organic substance directly or indirectly.

Claim 14. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein after passing through the heating-up zone, the heat-carrying medium is divided in a part passing through the second reaction zone, and a part directly used in the pyrolysis reactor; and that the heat-carrying medium having passed through the second reaction zone, is passed on into the pyrolysis reactor, or is added to the remaining heat-carrying medium downstream of the pyrolysis reactor.

Claim 15. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the reactant, preferably steam, is admitted into the pyrolysis reactor at any desired point, preferably in a site

located as closely as possible to the discharge of the mixture consisting of the heat-carrying medium and the solid, carbon-containing residue.

Claim 16. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein a solid, liquid or gaseous fuel is at least partly used in the firing stage, such fuel neither being the material charged nor being formed at any point within the course of the process from said charged product or from any of its subsequent products.

Claim 17. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein at least a partial stream of the solid, carbon-containing residue produced in the pyrolysis reactor is discharged and not burnt in the firing stage.

Claim 18. (Currently Amended).

The method according to claim 1, ~~characterized in that~~ wherein the material charged is at least partially directly used as fuel in the firing stage.

Claim 19. (Currently Amended).

The method according to claim 1, ~~characterized in that~~
wherein in addition to the heat-carrying medium, a highly
basic, solid substance, preferably calcium oxide, calcium
hydroxide or calcium carbonate is passed through the pyrolysis
reactor, said substance being subsequently separated from the
heat-carrying medium as well, and being passed either through the
firing stage or directly discharged into the outside.

Claim 20. (Currently Amended).

The method according to claim 1, ~~characterized in that~~
wherein the product gas is cooled and the condensation
product formed in the cooling process is purified, ~~if need be,~~
and reused for generating the process steam, or added to the
firing stage, or prior to the firing process, is added to the
carbon-containing residue for the purpose of evaporation and
combustion of the combustible components contained therein.